Arrow Vision Series - Power Management

High Power Distribution

Ruud van den Brink

7/15/2013

EVERY CONNECTION COUNTS

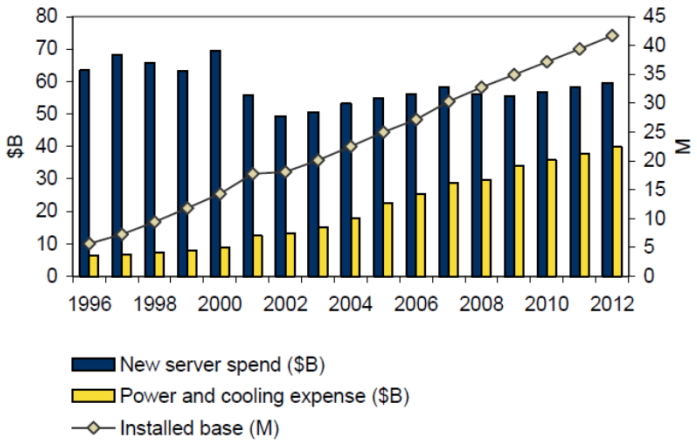
TE connectivity

Agenda

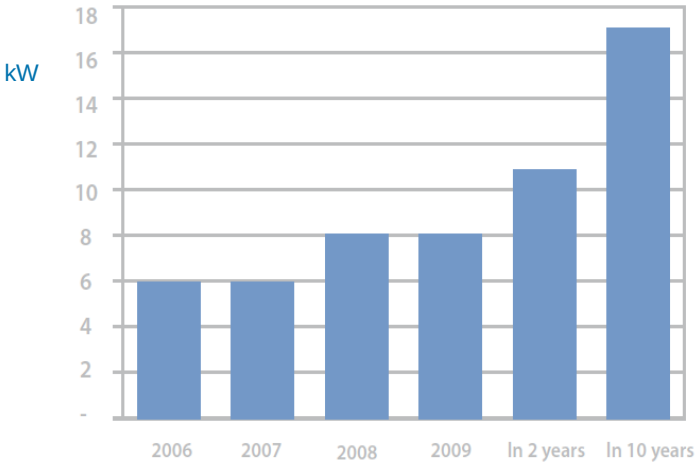
- Equipment Trends
- Technology Trends and Customer Needs
- Complete Power Distribution Solutions
  - Power Cable Assemblies
  - Wave Crimp
  - Bus Bar Assemblies

Data Center and Telecom Equipment Trends

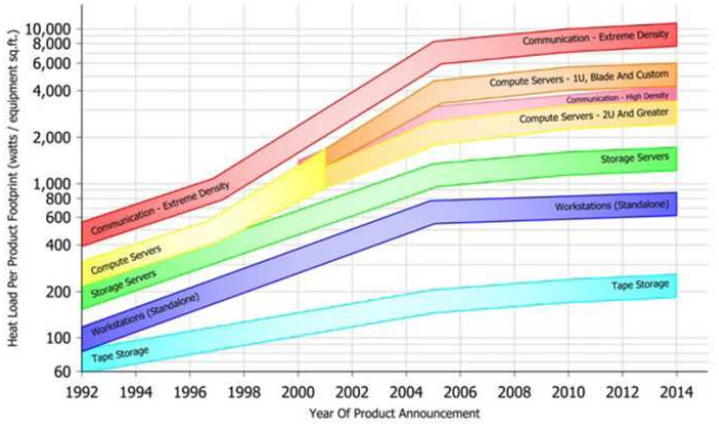
Worldwide Expense to Power and Cool the Server Installed Base, 1996–2012



Source: IDC, 2008

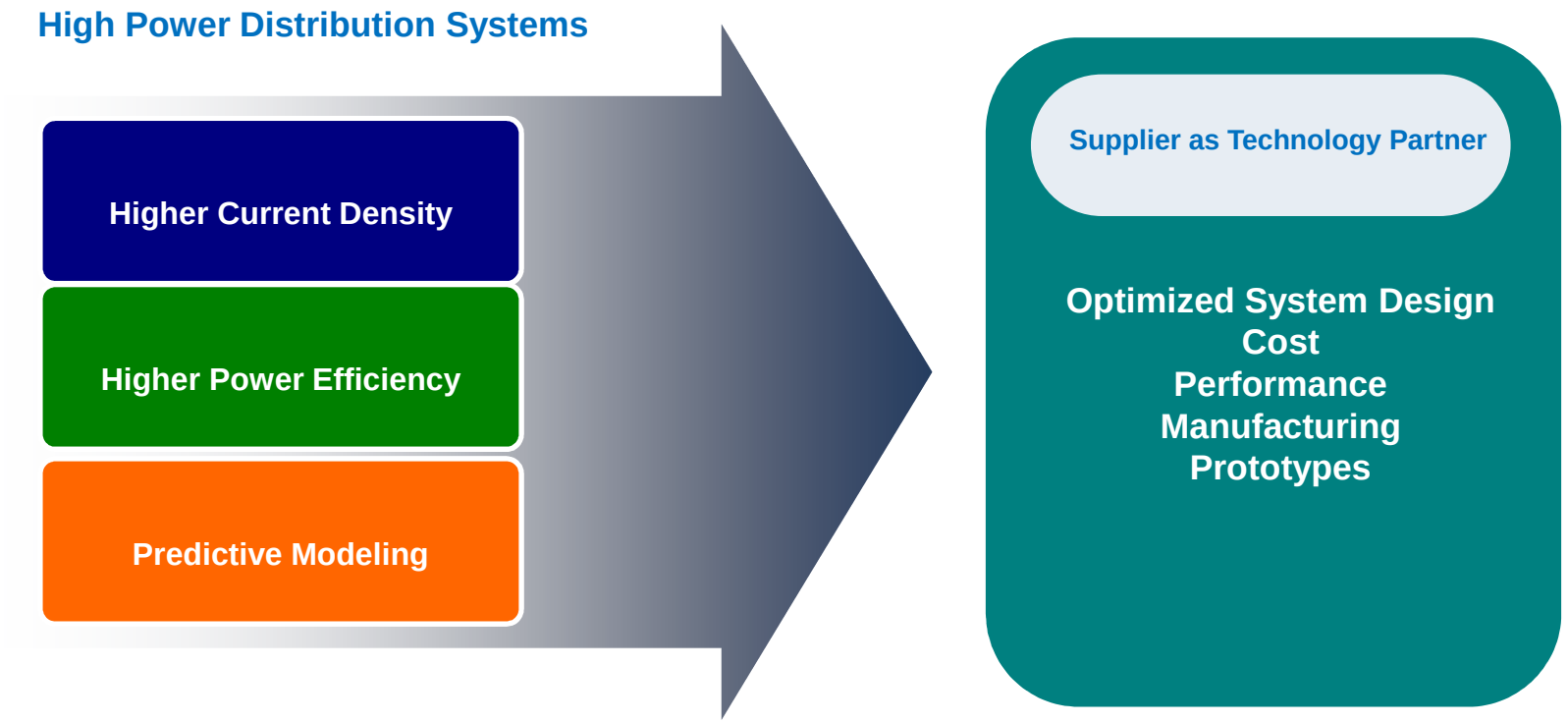


- Higher bit rates combined with more functionality per volume outpaces power reduction efforts on functionality.

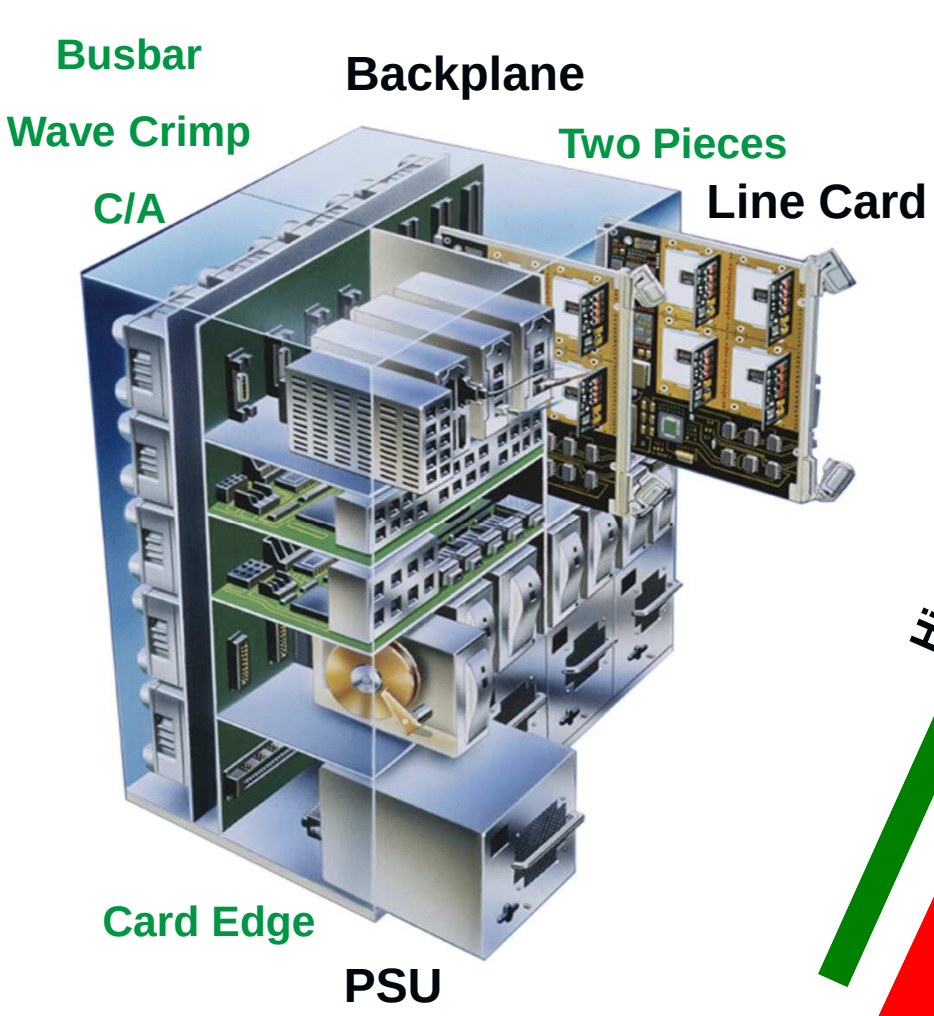


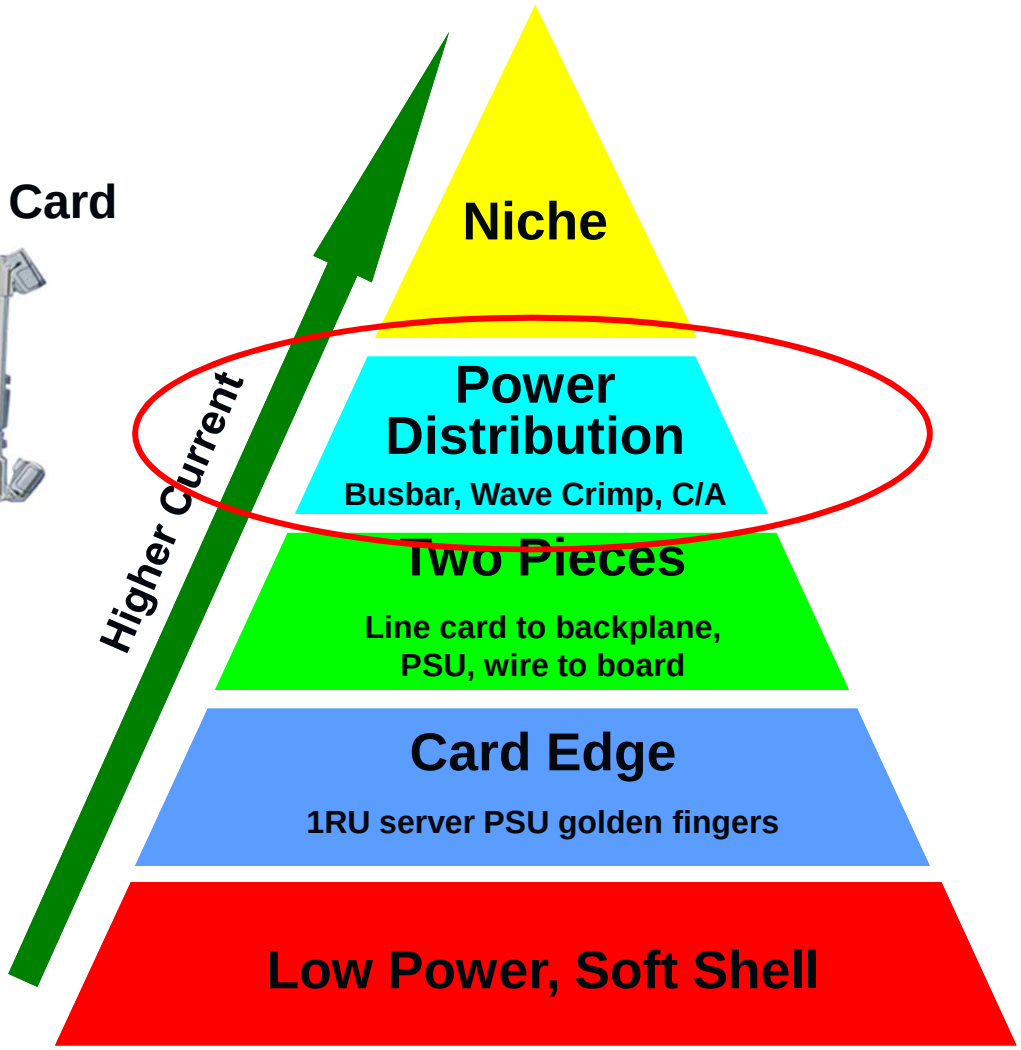
- Power consumption growing to 7200W per rack, to over 15kW for the next generations:
  - Currents increase over time by at least a factor 3
  - 15kW with low voltage equals currents of over 300A

Key Customer Needs and Technology Trends

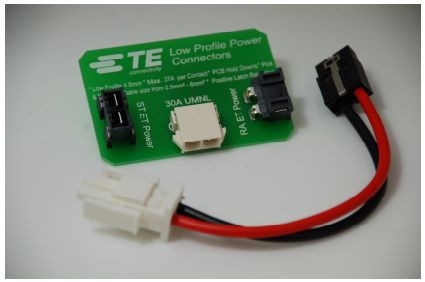


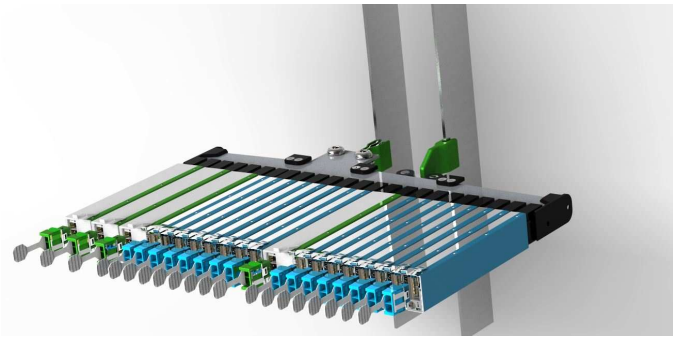
DTC Power Portfolio Introduction





Complete Power Distribution Solutions for Design-in!

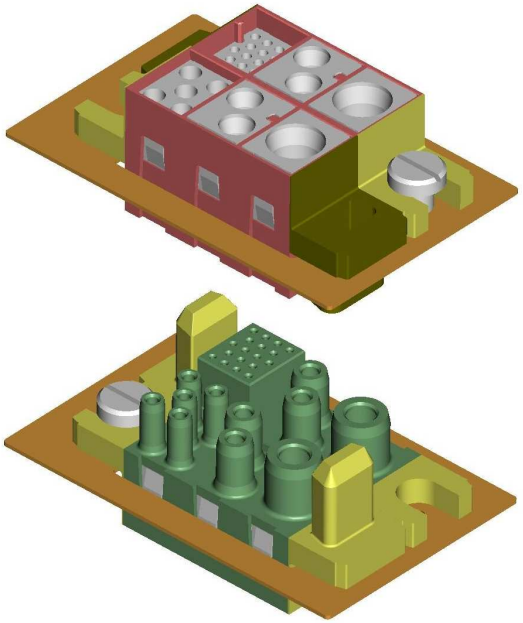


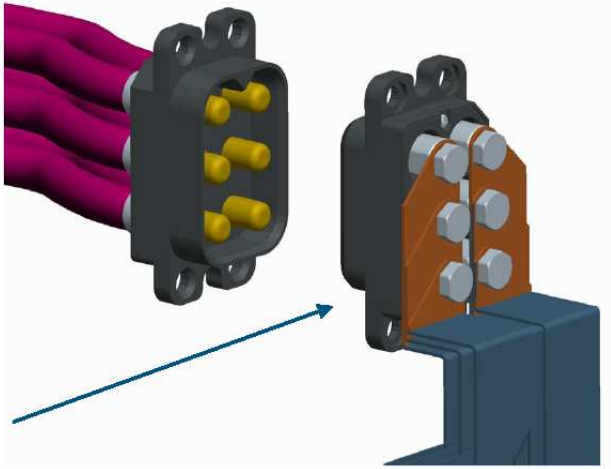


Power Cable Assembly **Wave Crimp** **Busbar Assembly**

Forge: High Voltage/Current/Efficiency Blind-Mate

Existing Drawers

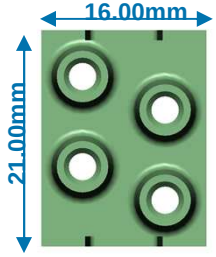




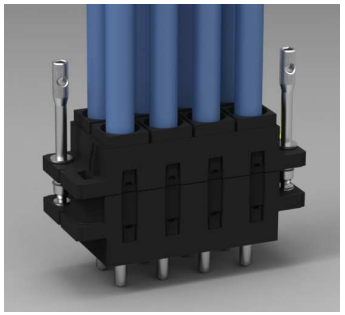
5 Contacts to choose from:
- Size 0 – 200Amps
- Size 4 – 100 Amps
- Size 8 – 50 Amps
- Size 12 – 25 Amps
- Size 22 – 3 Amps

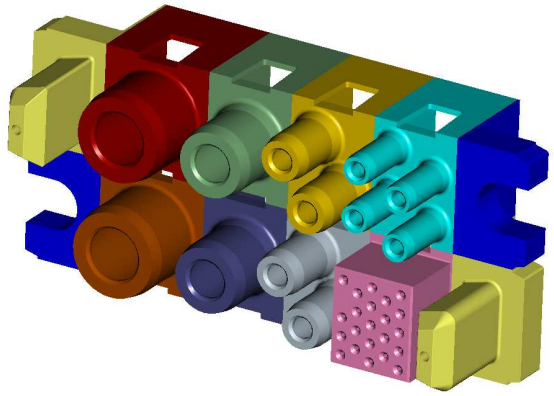
Wavecrimp:
- Dissipates heat better
- Carries same current with:
  - Flexible routing
  - Space savings
  - Improved airflow
  - Less weight

Forge: Customizable & Expandable



Typical Module Size





- Expandable / Modular Mold
- Housings can be designed in 2-row x 1 column to 5 column configurations; 10 modules maximum
- Single piece housings when complete
  - Better strength
  - Higher density
  - Better dimensional consistency

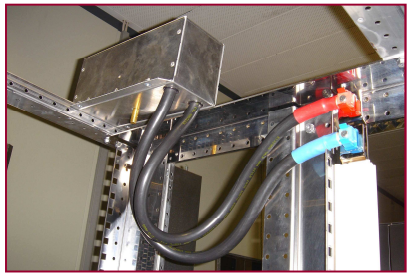
Configuration can be specified using any combo:

Contact Size	# Contacts / Module	Max Number Modules[1]
Size #0	1	6
Size #4	1	4
Size #8	2	2
Size #12	4	3
Size #22	22	1

Note 1: Other options may be available, contact TE Connectivity for more information

RAPID LOCK: Power Supply into the Rack

- Replacement of threaded studs in:
  - Power Distribution Units (PDUs)
  - Power Supply Units (PSUs)
  - Various power distribution structures.



- **No tools** required to make a RAPID LOCK connection
- **No loose parts** (e.g. nuts, washers,..)
- **No fretting**
- **Low contact resistance**/no heat rise
- **No torque settings** required by Installer
- Due to UL recognition **no additional testing of ground connections in the installation required**

RAPID LOCK: High Performance- High Current Solutions

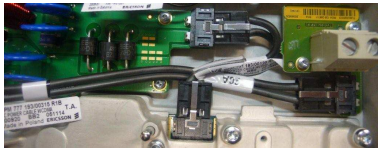
- Features and Benefits
  - R/A and Straight connectors
  - Quick connect/disconnect
  - Safety Locking Feature
  - Currents supported up to 250A
  - Wire sizes from 2.5 to 95mm²
  - Color Coding Available
  - Protective Cable/Crimp Covers
  - Industry Standard Crimp Tooling

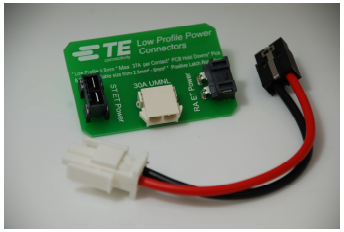
AMP Power Series: Power Supply into the Rack

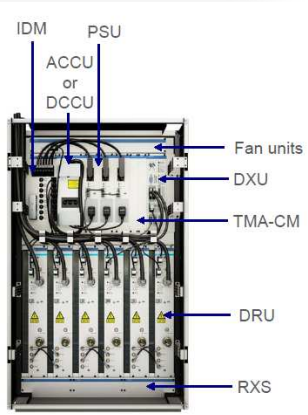
- Features and Benefits
  - Single-pole and 2-pole power connectors
  - Available in nine series with current ratings from 15 to 275* amps and voltage ratings up to 600 volts (AC or DC); equivalent to competition
  - Contact wire range from 12 AWG to 300 MCM
  - Integral stainless steel locking spring in housing for contact retention and mating force
  - Cable to Cable solutions
  - Cable to Bus-Bar

ET Connector I/O Power: Secondary Power Distribution

- Features and Benefits
  - Very cost effective solution for cable to board power
  - Low profile (8mm)
  - Silver plated contacts
  - Cable size supported from 2.5mm2 to 6mm2
    - Standard Timer Contacts
  - Currents supported up to 37.5 A
  - Positive latch retention
  - Vertical and R/A board connectors
  - Pick and Place PCB connectors
  - PCB Hold Downs
  - Sample kit available (1551165-1)



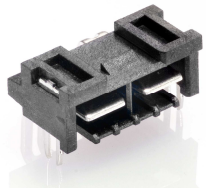




ET Connector I/O Power Roadmap

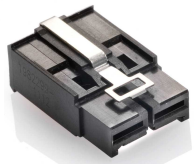
2 Position ET

Vertical board
Horizontal board
Cable plug



1982295-2

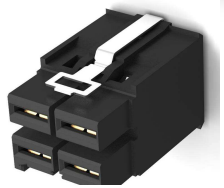
2042274-2



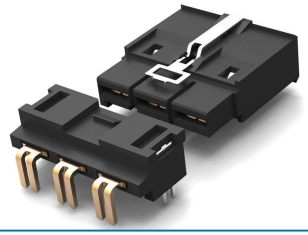
1982299-4

More Contacts

2x2 ET



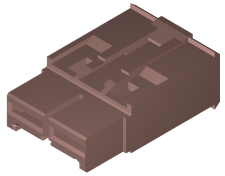
3 Position ET



Higher performance

2 Position ET with 6mm2

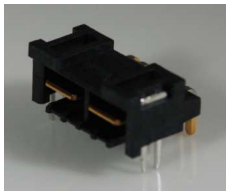
Cable plug supporting 37.5A



Ruggedized

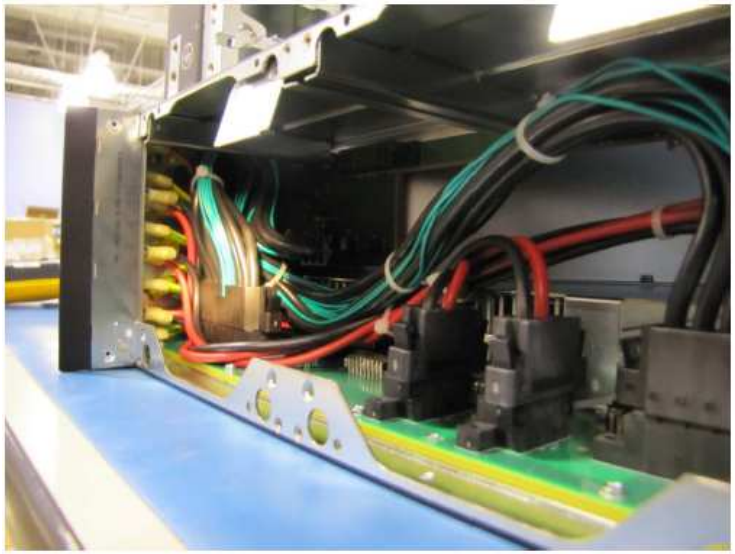
Gold Plated ET

Vertical board
Horizontal board
Cable plug



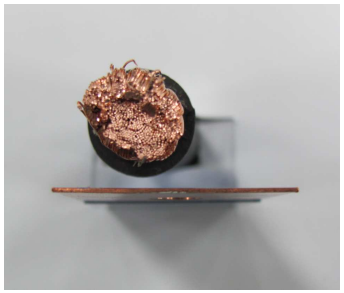
Wave Crimp: The Flexible Bus Bar

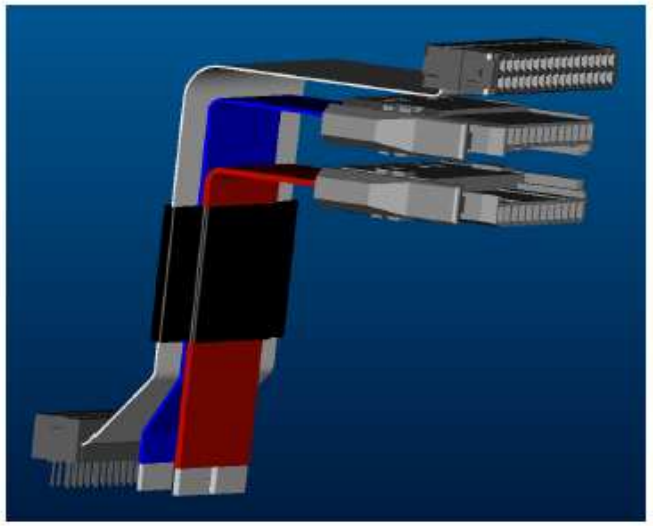
- New cable sizes up to **135Amps per cable**

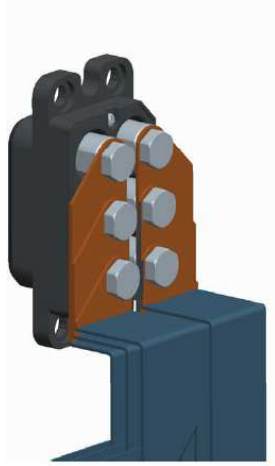


Replace this

With This →

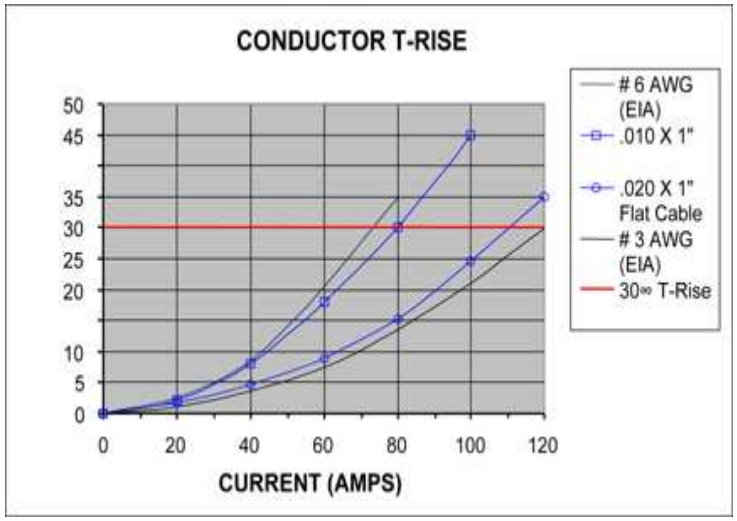


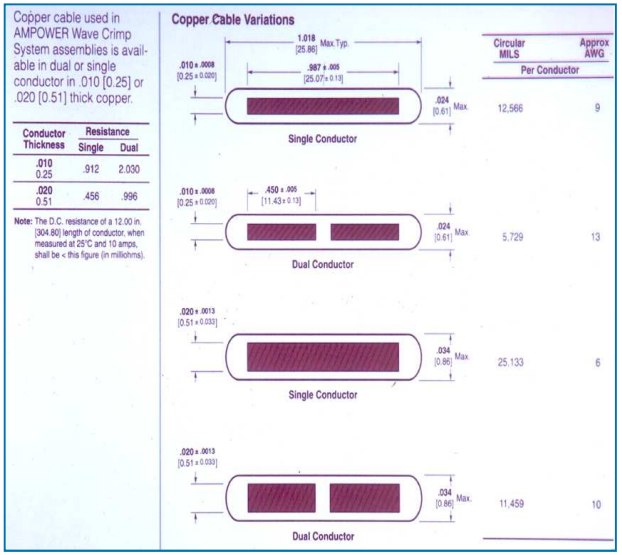




Wave Crimp Advantages

- Improved thermal performance
  - Surface of flat cable is twice as big as a round cable.
  - The advantage here is less copper, therefore less weight and cost per ampere of rated current.



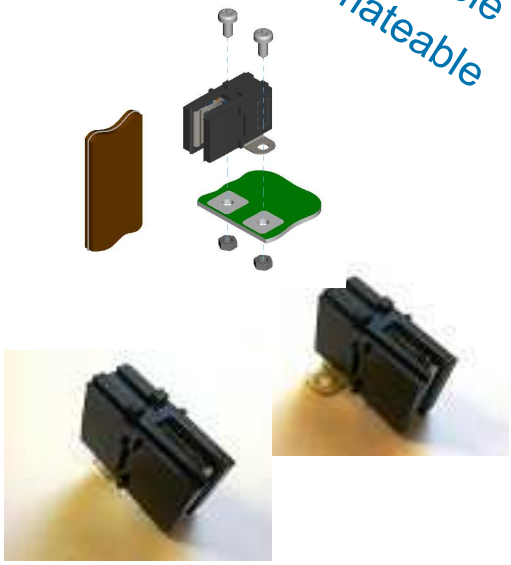


- Flat copper cable is available in:
  - Four styles
  - current carrying capability of up to 135 amps per conductor.
  - Each of these cable options is easily terminated with the Wave Crimp technology

From a Broad Set of Bus Bar Connector Solutions to:…..

170A

Hot pluggable
Blind mateable

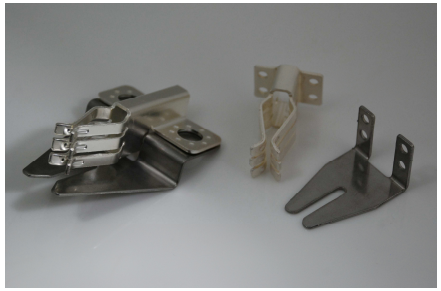


300A

Hot pluggable

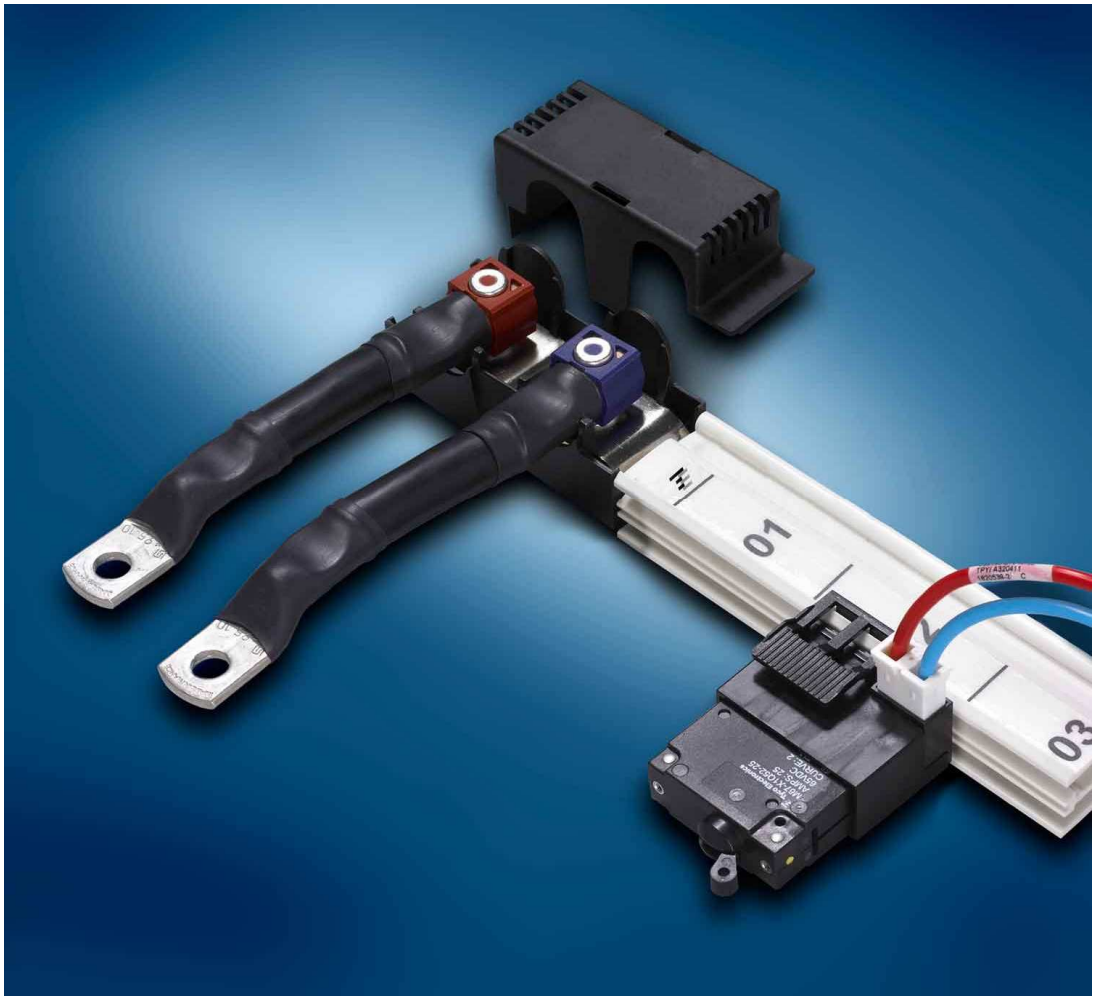
500A

Blind mateable
Anti overstress feature



Crown Clip Junior **Crown Clip** **Pluggable Bus Bar**

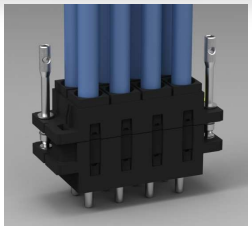
……Complete Bus Bar Assemblies



More Information

- Forge

http://www.te.com/catalog/minf/en/860



- Power Drawer

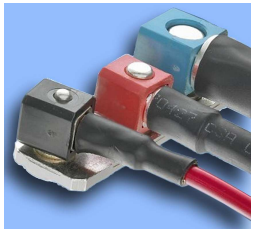
http://www.te.com/catalog/minf/en/563

- Wave Crimp

http://www.te.com/catalog/cinf/en/c/11930/1484

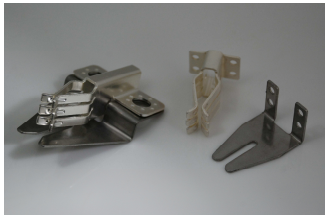
- Rapid Lock

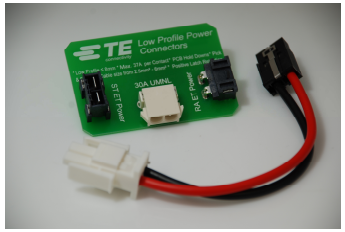
http://www.te.com/catalog/minf/en/517



- Bus Bar Connectivity

http://www.te.com/catalog/minf/en/371
http://www.te.com/catalog/cinf/en/c/11410/2696
http://www.te.com/catalog/minf/en/733





- ET

http://www.te.com/catalog/minf/en/855

- AMP Power Series

http://www.te.com/catalog/minf/en/732

THANK YOU !

Don’t Forget to Attend our TE Afternoon Track 4 session:
Low and Mid Range Modular Power Design

For More Information:

Existing Arrow Customers: 800 777 2776

New Customers: 800 833 3557

www.arrownac.com/powermanagement